

# Technical Memorandum

**TO:** Brenda Shine, Environmental Engineer  
Refining and Chemicals Group, SPPD (E143-01)

**FROM:** Eric Goehl, Environmental Protection Specialist  
Refining and Chemicals Group, SPPD (E143-01)

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**SUBJECT:** Summary of Catalytic Reforming Unit Emission Source Test Reports

## I. Purpose

The objective of this document is to provide a summary of the Catalytic Reforming Unit (CRU) emission source test reports received by the EPA from the 2011 Information Collection Request (ICR) of the Petroleum Refinery industry.

## II. Background

On April 1, 2011, the EPA sent an ICR to facilities in the U.S. petroleum refining industry. The ICR was comprehensive and designed to collect information on processing characteristics, crude slate characteristics, emissions inventories and source testing to bolster our current data and fill known data gaps. The ICR had four components: (1) a questionnaire on processes and controls to be completed by all petroleum refineries (Component 1); (2) an emissions inventory to be developed by all petroleum refineries using the emissions estimation protocol developed for this effort (Component 2); (3) distillation feed sampling and analysis to be conducted by all petroleum refineries (Component 3); and (4) emissions source testing to be completed in accordance with an EPA-approved protocol for specific sources at specific petroleum refineries (Component 4).

Component 4 of the ICR required source testing for twelve different types of emission sources or units: fluid catalytic cracking units (FCCU), thermal catalytic cracking units, catalytic reforming units, sulfur recovery units, delayed coking units, fluid coking units, hydrocracking units, hydrogen plants, asphalt blowing units, fuel gas systems, cooling water systems, and wastewater treatment systems. This memorandum summarizes the results of the CRU sources tests. A similar memorandum is available for the other sources required to be tested as a result of this ICR. Facilities often claimed specific process information as CBI, and included that

information in the CBI version of the emission source test report stored in the EPA's CBI office in Research Triangle Park, NC. However, emissions data cannot be claimed as CBI. This memorandum summarizes and presents only non-CBI data.

### **III. Source-specific Testing Program**

**Below is a list of the facilities required to perform an emission source test on their CRU.**

- CITGO - Corpus Christi, TX – Coke Burn Vent (TX3B1131)
- Delek Refining – Tyler, TX – Coke Burn Vent (TX3A1190)
- Shell Oil – Deer Park, TX – Coke Burn Vent (TX3B1260)
- ConocoPhillips WRB – Roxana, IL – Coke Burn Vent (IL2A0430)
- Marathon Petroleum – Garyville, LA – Coke Burn Vent (LA3C0610) Note: Facility asked the EPA if they could test their CRU at their Garyville, LA plant in the place of their CRU at their Catlettsburg, KY plant (KY2A0490).
- ExxonMobil – Baton Rouge, LA – Coke Burn Vent and Purge Vent (LA3C0590)
- Frontier – El Dorado, KS – Coke Burn Vent and Purge Vent (KS2C0480)
- Tesoro – Anacortes, WA – Coke Burn Vent (WA5A1420)
- Sunoco – Marcus Hook, PA – Coke Burn Vent (PA1A1020)
- Motiva – Port Arthur, TX – Coke Burn Vent (TX3B1220) Note: Facility asked the EPA if they could test their CRU at their Port Arthur, TX plant in the place of their CRU at their Convent, LA plant (LA3C0620).

**The following facilities did not submit the required emission source test report.**

- Houston Refining – Houston, TX (TX3B1200) – Facility indicated that this unit has been idle since the ICR was sent out and not expected to be brought back online in the near future.
- Western Refining – El Paso, TX (TX3A1120) – Facility stated they were between regeneration cycles and the next cycle was not until summer 2012.

**Owners or operators of the CRU at these facilities were required to test for:**

**Purge Vent**

- Speciated volatile organic hazardous air pollutants (HAP)
- Speciated semi-volatile organic HAP
- Total hydrocarbons, methane, and ethane
- Aldehydes
- Carbon monoxide
- O<sub>2</sub>, CO<sub>2</sub>, moisture, and gas flow rate.

**Coke Burn Vent**

- Speciated volatile organic hazardous air pollutants (HAP)
- Dioxins, furans, and polychlorinated biphenyls
- Hydrogen chloride, chlorine, hydrogen fluoride, and hydrogen cyanide
- Mercury (speciated)
- Multiple metals
- Particulate matter (PM, PM<sub>2.5</sub> filterable, and PM condensable)
- NO<sub>x</sub>, SO<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub>, moisture, and gas flow rate.

The EPA required that the data collected from the emission source testing to be reported using the EPA Electronic Reporting Tool (ERT). The ERT is a Microsoft® Access database application. If the facility conducted testing using a method not currently supported by the ERT, the facility was required to report the results in the Refinery Testing Supplement, a Microsoft® Excel spreadsheet. After completing the Refinery Testing Supplement, the refineries were also to submit an electronic copy of the emission test report, preferably in PDF format.

**IV. Results**

A summary of the emission results for the CRU are provided in attached spreadsheet. In order to better characterize the reported data from the emission test reports, detection level information was provided in the attached summary spreadsheet. The following designations were used to describe the detection levels of the reported emissions data.

- DLL = Detection Level Limited = 1 or 2 runs below detection limit
- BDL = Below Detection Limit = All three runs are below detection limit
- No designation = All three runs are above detection limit